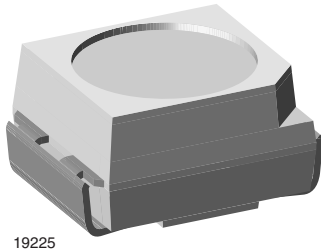


Low Current SMD LED PLCC-2



FEATURES

- SMD LED with exceptional brightness
- Compatible with automatic placement equipment
- EIA and ICE standard package
- Compatible with infrared, vapor phase and wave solder processes according to CECC
- Available in 8 mm tape
- Low profile package
- Non-diffused lens: excellent for coupling to light pipes and backlighting
- Very low power consumption
- Luminous intensity ratio in one packaging unit $I_{Vmax}/I_{Vmin.} \leq 2.0$
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

 AUTOMOTIVE
GRADE

RoHS
COMPLIANT
GREEN
(5-2008)**

DESCRIPTION

These new devices have been designed to meet the increasing demand for low current SMD LEDs.

The package of the VLMA3100 is the PLCC-2 (equivalent to a size B tantalum capacitor).

It consists of a lead frame which is embedded in a white thermoplast. The reflector inside this package is filled up with clear epoxy.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: SMD PLCC-2
- Product series: Low Current
- Angle of half intensity: ± 60

APPLICATIONS

Automotive: Backlighting in dashboards and switches

- Telecommunication: Indicator and backlighting in telephone and fax
- Indicator and backlight for audio and video equipment
- Indicator and backlight for battery driven equipment
- Small indicator for outdoor applications
- Indicator and backlight in office equipment
- Flat backlight for LCDs, switches and symbols
- General use

PARTS TABLE

PART	COLOR, LUMINOUS INTENSITY	TECHNOLOGY
VLMA3100-GS08	Yellow, $I_V \geq 0.28$ mcd	GaAsP on GaP
VLMA3100-GS18	Yellow, $I_V \geq 0.28$ mcd	GaAsP on GaP

** Please see document "Vishay Material Category Policy": www.vishay.com/doc?99902



ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) VLMA3100				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage ¹⁾		V_R	6	V
DC Forward current		I_F	7	mA
Surge forward current	$t_p \leq 10\text{ }\mu\text{s}$	I_{FSM}	0.5	A
Power dissipation		P_V	20	mW
Junction temperature		T_j	100	$^{\circ}\text{C}$
Operating temperature range		T_{amb}	- 40 to + 100	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	- 40 to + 100	$^{\circ}\text{C}$
Soldering temperature	$t \leq 5\text{ s}$	T_{sd}	260	$^{\circ}\text{C}$
Thermal resistance junction/ambient	Mounted on PC board (pad size > 16 mm ²)	R_{thJA}	500	K/W

Note:

¹⁾ Driving the LED in reverse direction is suitable for short term application

OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) VLMA3100, YELLOW						
PARAMETER	TEST CONDITION	SYMBOL	MIN	TYP.	MAX	UNIT
Luminous intensity ¹⁾	$I_F = 2\text{ mA}$	I_V	0.28	2.5		mcd
Dominant wavelength	$I_F = 2\text{ mA}$	λ_d	581		594	nm
Peak wavelength	$I_F = 2\text{ mA}$	λ_p		585		nm
Angle of half intensity	$I_F = 2\text{ mA}$	ϕ		± 60		deg
Forward voltage	$I_F = 2\text{ mA}$	V_F		2.2	2.9	V
Reverse voltage	$I_R = 10\text{ }\mu\text{A}$	V_R	6	20		V
Junction capacitance	$V_R = 0, f = 1\text{ MHz}$	C_j		50		pF

Note:

¹⁾ In one packing unit $I_{Vmax}/I_{Vmin.} \leq 2.0$

LUMINOUS INTENSITY CLASSIFICATION		
GROUP	LUMINOUS INTENSITY (mcd)	
	MIN.	MAX.
C1	0.28	0.36
C2	0.36	0.45
D1	0.45	0.56
D2	0.56	0.71
E1	0.71	0.90

Note:

Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of $\pm 11\%$.

The above Type Numbers represent the order groups which include only a few brightness groups. Only one group will be shipped on each reel (there will be no mixing of two groups on each reel). In order to ensure availability, single brightness groups will not be orderable.

In a similar manner for colors where wavelength groups are measured and binned, single wavelength groups will be shipped on any one reel.

In order to ensure availability, single wavelength groups will not be orderable.

COLOR CLASSIFICATION		
GROUP	DOMINANT WAVELENGTH (nm)	
	YELLOW	
	MIN.	MAX.
1	581	584
2	583	586
3	585	588
4	587	590
5	589	592
6	591	594

Note:

Wavelengths are tested at a current pulse duration of 25 ms.

TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

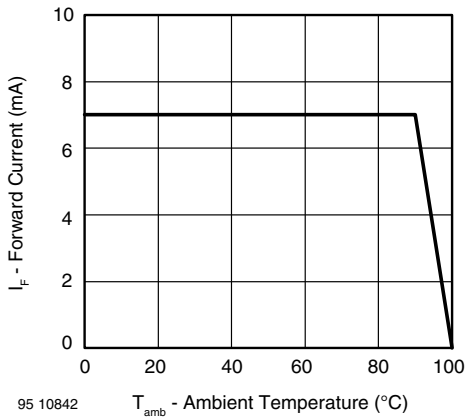


Figure 1. Forward Current vs. Ambient Temperature

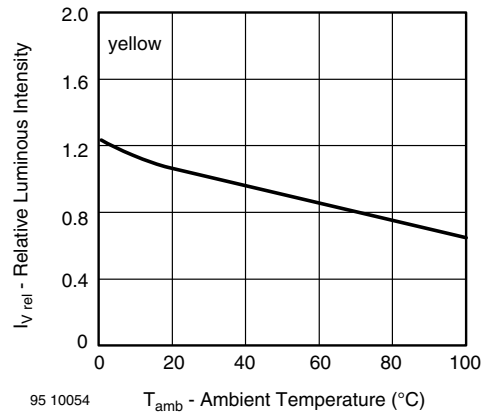


Figure 4. Rel. Luminous Intensity vs. Ambient Temperature

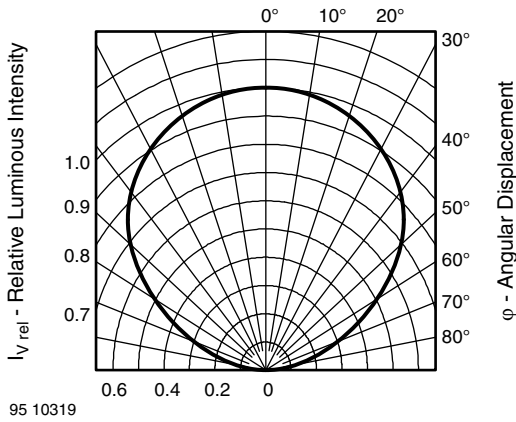


Figure 2. Rel. Luminous Intensity vs. Angular Displacement

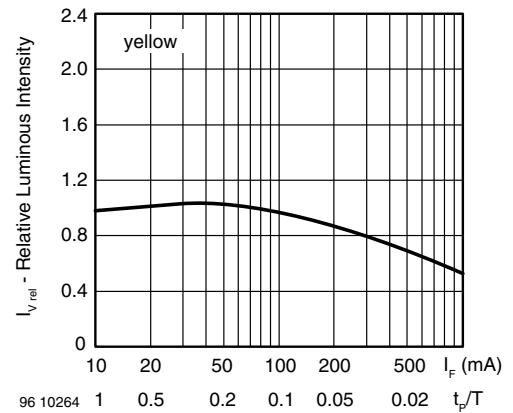


Figure 5. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

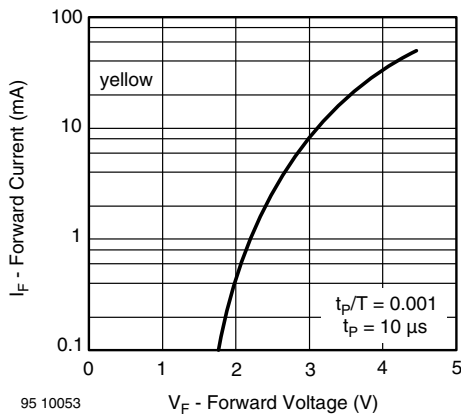


Figure 3. Forward Current vs. Forward Voltage

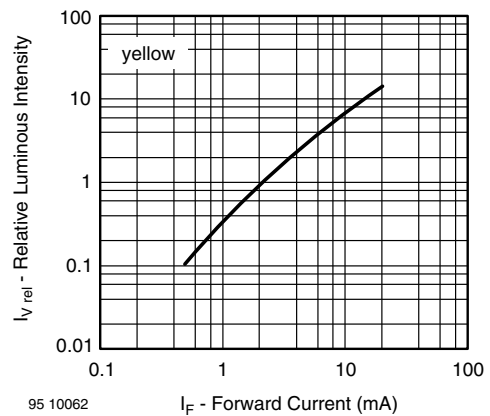


Figure 6. Relative Luminous Intensity vs. Forward Current

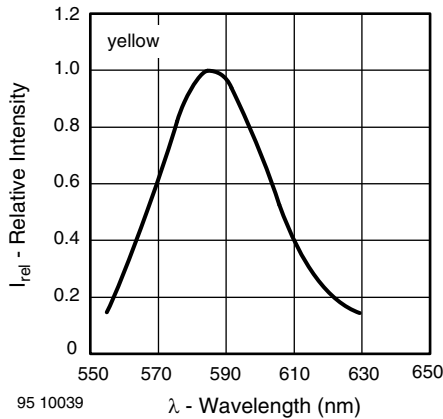
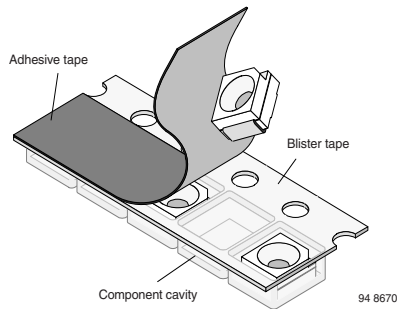


Figure 7. Relative Intensity vs. Wavelength

METHOD OF TAPING/POLARITY AND TAPE AND REEL

SMD LED (VLM.3 - SERIES)

Vishay's LEDs in SMD packages are available in an antistatic 8 mm blister tape (in accordance with DIN IEC 40 (CO) 564) for automatic component insertion. The blister tape is a plastic strip with impressed component cavities, covered by a top tape.



REEL PACKAGE DIMENSION IN MILLIMETERS FOR SMD LEDs, TAPE OPTION GS08 (= 1500 PCS.)

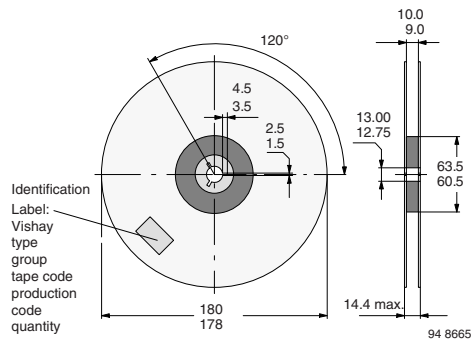


Figure 9. Reel dimensions - GS08

TAPING OF VLM.3...

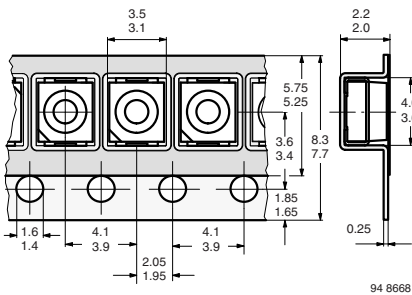


Figure 8. Tape dimensions in mm for PLCC-2

REEL PACKAGE DIMENSION IN MILLIMETERS FOR SMD LEDs, TAPE OPTION GS18 (= 8000 PCS.) PREFERRED

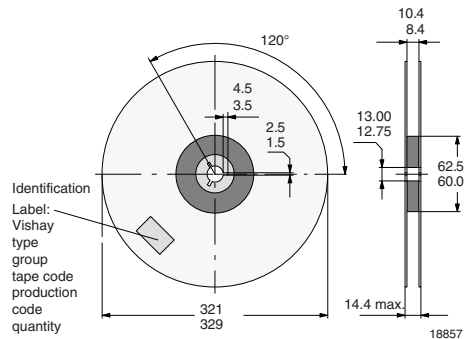


Figure 10. Reel dimensions - GS18

SOLDERING PROFILE

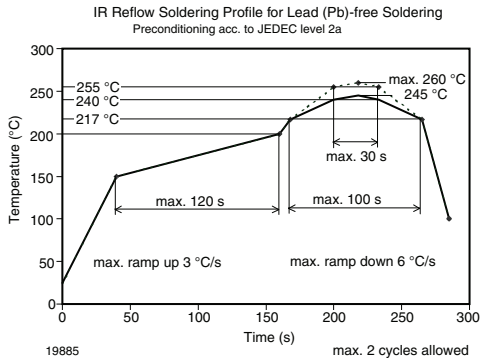


Figure 11. Vishay Lead (Pb)-free Reflow Soldering Profile (acc. to J-STD-020C)

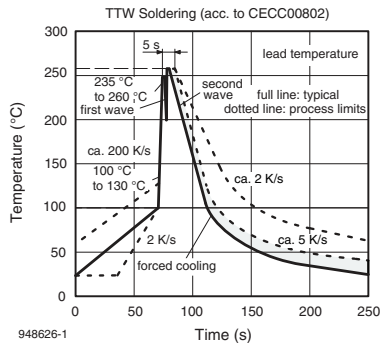
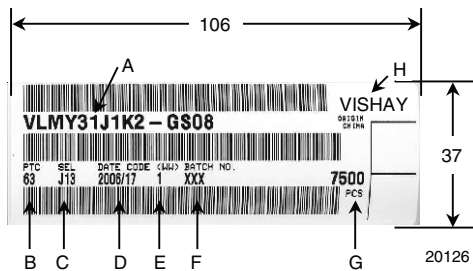


Figure 12. Double wave soldering of opto devices (all packages)

BARCODE-PRODUCT-LABEL

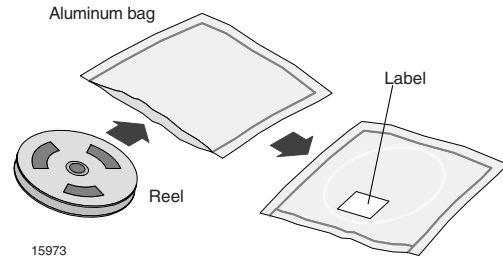
EXAMPLE:



- A) Type of component
- B) Manufacturing plant
- C) SEL - Selection Code (Bin):
e.g.: J1 = Code for Luminous Intensity Group
3 = Code for Color Group
- D) Date Code year/week
- E) Day Code (e.g. 1: Monday)
- F) Batch No.
- G) Total quantity
- H) Company code

DRY PACKING

The reel is packed in an anti-humidity bag to protect the devices from absorbing moisture during transportation and storage.



FINAL PACKING

The sealed reel is packed into a cardboard box. A secondary cardboard box is used for shipping purposes.

RECOMMENDED METHOD OF STORAGE

Dry box storage is recommended as soon as the aluminum bag has been opened to prevent moisture absorption. The following conditions should be observed, if dry boxes are not available:

- Storage temperature 10 °C to 30 °C
- Storage humidity ≤ 60 % RH max.

After more than 672 hours under these conditions moisture content will be too high for reflow soldering.

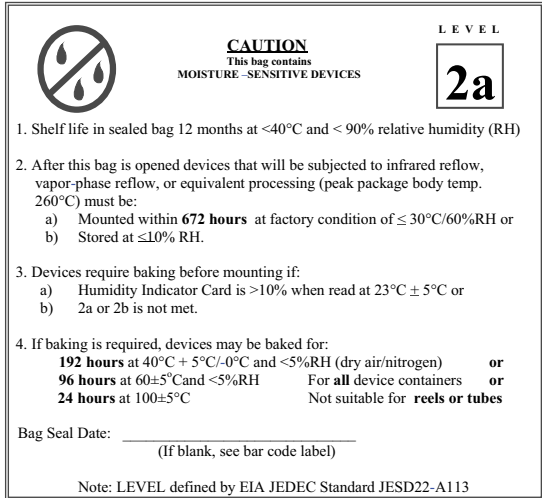
In case of moisture absorption, the devices will recover to the former condition by drying under the following condition:

192 hours at 40 °C + 5 °C/- 0 °C and < 5 % RH (dry air/nitrogen) or

96 hours at 60 °C + 5 °C and < 5 % RH for all device containers or

24 hours at 100 °C + 5 °C not suitable for reel or tubes.

An EIA JEDEC Standard JESD22-A112 Level 2a label is included on all dry bags.



Example of JESD22-A112 Level 2a label

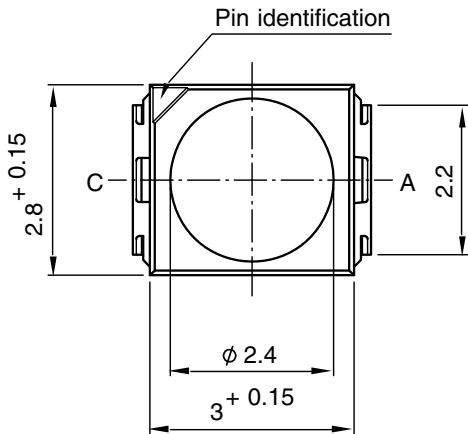
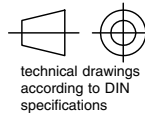
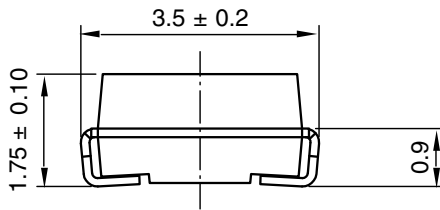
ESD PRECAUTION

Proper storage and handling procedures should be followed to prevent ESD damage to the devices especially when they are removed from the Antistatic Shielding Bag. Electro-Static Sensitive Devices warning labels are on the packaging.

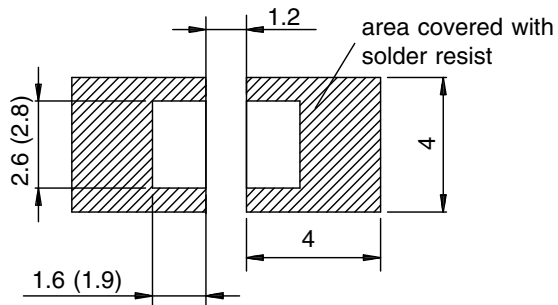
VISHAY SEMICONDUCTORS STANDARD BAR-CODE LABELS

The Vishay Semiconductors standard bar-code labels are printed at final packing areas. The labels are on each packing unit and contain Vishay Semiconductors specific data.

PACKAGE DIMENSIONS in millimeters



Mounting Pad Layout



Drawing-No.: 6.541-5025.01-4
 Issue: 8; 22.11.05
 95 11314-1



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